

## **IMPROVED MODULAR DECKING PLANKS**

### **FIELD OF THE INVENTION**

**[0001]** The present invention relates generally to construction materials and more particularly to materials used for indoor and outdoor decking. In even greater particularity the present invention relates to the use of prefabricated decking planks and in still greater particularity to decking planks made from extruded materials. The invention is applicable, for example, in the construction of boat docks, piers, decks, patios, walkways, pontoon boat floors, and the like.

### **BACKGROUND OF THE INVENTION**

**[0002]** Extruded polyvinyl building and construction materials are increasing in popularity due to their light weight, which greatly simplifies shipping, handling and installation, and also due to their durability in adverse weather conditions, which greatly increases their service life. Polyvinyl materials do not need to be periodically painted or preserved, which greatly lowers maintenance costs, and modern ultra-violet inhibitors prevent UV breakdown of polyvinyl materials for many years. Extruded hollow members offer utility similar to wood or molded members but are cheaper and easier to mass-produce than conventional molded members; and, extruded members can be easily formed with internal reinforcing ribs or webs to add strength and stiffness. As such, the hollow extruded members offer a long lasting, low maintenance, and cost effective alternative for traditional wood floor members, such as on decks, floors, porches, marine docks and similar applications.

[0003] Because nails or screws driven directly through the plastic are likely to cause stress risers and/or cracking, the hollow extruded members require special mounting brackets or cleats in order to secure the members to the supporting frame or structure.

[0004] On certain polyvinyl decking systems, the decking members have a series of openings in the bottom surface, and the members are snapped onto mounting brackets or clips that have been attached to the top of the joist or support structure. Another prior art approach utilizes U-shaped mounting clips that are attached to the top of the joist. The decking members are secured to the upwardly extending legs of the mounting clip. Such prior art systems have a number of drawbacks, including relatively high material costs and relatively long installation time, and on many such systems it is difficult to properly align the holes in the deck members with the preinstalled clips. Moreover, if the pre-installed clips are not mounted properly the decking members may move or "wander" slightly, giving the deck an unsightly and unprofessional appearance.

[0005] According to one prior art plastic decking plank, separate cap and base elements are snapped together to form a single plank. The base element is first mounted directly to the subfloor with fasteners such as screws or nails. Mating components of the cap and base elements are then manually aligned, and a rubber hammer or other tool is used to snap-attach the pieces together. Unlike the invention, such two-piece designs generally require substantial time and effort to assemble.

[0006] Another drawback with prior art methods is that polyvinyl, like all construction materials, flexes slightly under load. On conventional wood decks such flexing is almost completely unnoticeable. However, on plastic or polyvinyl decks such flexing often creates an unnerving and unpleasant squeak or creaking sound. For many reasons, most consumers

consider such squeaking and creaking a very undesirable attribute. Accordingly, there exists a need for an improved polyvinyl decking system that is cost effective to produce and install, and that does not have any of the unfavorable characteristics that plague prior art polyvinyl decking systems. Further, known polyvinyl decking has a tendency to deform along reinforcement lines, thus creating unsightly rows along the plank.

[0007] The present invention utilizes extruded tubular decking members that have internal reinforcing webs to maximize flexural strength and stiffness. The present invention also utilizes a unique interlocking feature between adjacent decking members and maintains the proper spacing between deck members and also secures the deck members to each other and to the supporting joists.

#### SUMMARY OF THE INVENTION

[0008] The present invention provides a decking system for placement on a subassembly that provides a substantially watertight surface above the subassembly. The decking system includes a plurality of elongated tubular elements for placement in lateral interlocking engagement with each other transversely of and spanning the distance between the joists. Each of the elements has a top portion, a bottom portion, and first and second side walls connecting the top portion with the bottom portion. The top portion extends laterally beyond the first side wall and has a downwardly extending longitudinal flange formed at one end. The bottom portion extends laterally beyond said second side wall and has an upwardly extending longitudinal wall defining an upwardly opening channel adjacent. The second side wall is adapted to receive therein in watertight relation said downwardly extending longitudinal flange. The bottom portion additionally includes a series of apertures traversing the bottom portion proximate the upwardly

extending longitudinal wall. Finally, a plurality of fasteners are included in the present invention that traverse the apertures to engage the elements with the subassembly.

#### BRIEF DESCRIPTION OF THE DRAWINGS

[0009] The system embodying the present invention is depicted in the accompanying drawings that form a portion of the invention and wherein:

[0010] Figure 1 is a perspective view of a deck plank made in accordance with the present invention;

[0011] Figure 2 is a partial section view of Figure 1;

[0012] Figure 3 is a sectional view of a plurality of planks being installed; and

[0013] Figure 4 is a sectional view of the installed planks.

#### DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0014] Referring to the drawings for a clearer understanding of the present invention it may be seen in Figure 1 that the present invention contemplates an elongated extruded construction element 10 or plank having a top wall portion 11, a bottom wall portion 12, a first side wall 13 connecting the top wall portion 11 and the bottom wall portion 12, and a second side wall 14 additionally connecting the top wall portion 11 and the bottom wall portion 12. The construction element 10 is preferentially extruded from PVC or some other suitable plastic; however, aluminum extrusion of the construction element 10 is also possible.

[0015] Top wall portion 11 extends laterally from the second side wall 14 past first side wall 13 and terminates in a downwardly extending flange 16. The downwardly extending flange 16 may include a pair of flange walls 17 on which a set of longitudinally extending ribs 18 are

formed in spaced relation to one another. The bottom wall portion 12 extends laterally from the first side wall 13 past second side wall 14 to an upstanding longitudinal wall 19. The second side wall 14 and the upstanding longitudinal wall 19 form an upwardly opening channel 21. The bottom wall portion 12 further extends past the upstanding longitudinal wall 19, providing an additional ridge or ledge 25.

[0016] A set of complementary elongated ribs 22 are formed on the second side wall 14 and the upstanding longitudinal wall 19 within channel 20. As may be seen in Figures 3 and 4, the ribs 18, 22 carried by the flange 16 and the channel 20 mate to form a watertight seal between adjacent plank elements 10.

[0017] As may be seen in Figure 2, one or more apertures 24 are formed in bottom wall portion 12 within the channel 21 to permit the use of fasteners 26 (such as screws) to engage a subassembly 27 beneath the construction elements 10. Moreover, to improve the security and the stability of the construction elements 10, the ledge 25 may instead include one or more apertures 24 that extend therethrough. The apertures 24 positioned on the ledge 25 provide a reinforced connection between the plank elements 10 and the subassembly 27, thereby adding to the stability of the plank elements 10 for the persons walking on these plank elements 10. These apertures 24 are therefore protected from water and corrosion by the top wall portion 11. The subassembly 27 may be a frame with joists or simply a subjacent surface.

[0018] To provide an attractive and functional upper surface, the top wall portion 11 of each plank is extruded with a series of lands and crests, including a plurality of parallel major lands 31 separated by major crests 32. The lands and crests generally have a longitudinal orientation on the top wall portion 11. Formed on the top of major crests 32 are a series of minor lands 33 and minor crests 34, shown as three lands and three crests in the preferred embodiment. Laterally of

the minor lands and adjacent the major lands the major crests are flat or planar. This tread pattern disguises the stress pattern caused by a plurality of longitudinally extending internal walls 28 by placing the major lands directly over the internal walls and first end wall 13. The internal walls 28 are about 0.120 inches wide whereas the major lands are about 0.159 inches wide. The distance from crest to root of the adjacent minor lands and crests is 0.030 inches, with the major lands measuring 0.6075 from center to center. Internal walls are spaced 1.215 inches apart and the width of the plank is 5.95 inches. The crests and lands provide excellent drainage, traction and appearance for the polyvinyl deck.

[0019] Thus, although there have been described particular embodiments of the present invention of a new and useful IMPROVED MODULAR DECKING PLANKS, it is not intended that such references be construed as limitations upon the scope of this invention except as set forth in the following claims.